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National Organic Standards Board
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Room 4008 - South Building
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Submitted via email to: Valerie.Frances@usda.gov

Submission to the Invitation for Public Comment on Aquaculture Standards

Please accept our submission in response to the National Organic Standards Board Livestock Committee's Invitation for Public Comment on Aquaculture Standards. As this is the first time the Pure Salmon Campaign is submitting comments on the proposed aquaculture standards, we have also provided a brief review of our general concerns regarding "organic" aquaculture, especially the labeling of carnivorous finfish aquaculture as "organic."

The Pure Salmon Campaign — a project of National Environmental Trust — is a partnership of over 30 conservation organizations from across the globe, with the common goal of raising the environmental and health standards for farm raised fish. The Pure Salmon Campaign believes there is a large body of peer-reviewed science that documents the numerous environmental impacts associated with the open net cage method of farming carnivorous finfish such as salmon.

The goal of the Pure Salmon Campaign is to shift the market towards a production method that provides a physical barrier between a fish farm and the marine environment, as a means of eliminating many of the environmental impacts that plague open net cage aquaculture. We believe that salmon can be farmed safely and with minimal ecological damage, if the industry adopts standards that protect the environment, consumers and local communities. In our perspective, this means:

- (1) Replacing open net cages with enclosed tanks equipped with proper water filtration systems for wastes; and
- (2) Developing more ecologically sustainable forms of food to replace the current "fish chow" containing fish meal, fish oil, chemicals, drugs and other toxic residues.

The Pure Salmon Campaign greatly appreciates the NOSB's efforts on organic

aquaculture and this invitation for further public comment. We urge the NOSB to ensure that the “USDA Organic” standard is neither modified nor diluted to accommodate carnivorous finfish aquaculture in open net cages. In order for the USDA Organic label to maintain its credibility among U.S. consumers, it is imperative that the core criteria of this organic standard remain consistent among terrestrial and aquaculture products. We believe that by allowing for open net cage systems such as those used to farm salmon to bear the organic label, the NOSB threatens to reduce consumer confidence in the USDA Organic label, in general.

It is our hope that the USDA Organic label will continue to provide consumers with a clear and consistent understanding of how their food was produced and ensure them that their choice of an organic food product supports a safer and more sustainable environment.

Sincerely,

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General Comments on Organic Aquaculture

We support organic aquaculture for herbivorous finfish (such as tilapia and catfish) and other low food chain species (such as shellfish) that are produced in controlled environments.

We do not support organic aquaculture for carnivorous finfish, especially those farmed in open net cages or integrated net pen systems.

While we support closed containment technology as a solution to many of the environmental impacts of carnivorous finfish farming, we believe that the natural dependence of carnivorous finfish on wild fish for feed makes carnivorous finfish inherently incompatible with an “organic” standard.

Comments on Organic Carnivorous Finfish Aquaculture in Open Net Cages

The Pure Salmon Campaign believes that the production of carnivorous finfish in open net cages is inconsistent with “organic” production on several fronts.

First, Section 205.201 of the National Organic Program Standards details the requirements of an organic production or handling system plan. Within this section, it states that organic production or handling must include:

- (2) A list of each substance to be used as a production or handling input, indicating its composition, source, location(s) where it will be used, and documentation of commercial availability, as applicable;
- (5) A description of the management practices and physical barriers established to prevent commingling of organic and nonorganic products on a split operation and to prevent contact of organic production and handling operations and products with prohibited substances;

In an **open** net cage system, it is impossible for a producer to track the inputs into the farm. By design, the open net cage lacks a complete physical barrier between the farmed fish and the marine environment. In turn, the farm is completely exposed to a host of uncontrolled inputs - such as water, a variety of living organisms, parasites such as sea lice, and wild fish diseases, and prohibited substances such as pollutants or chemicals that may exist or enter into the marine environment.

While this system may offer advantages to producers, in terms of a free water supply and filtration system, it allows for the interaction of the “organic” product with non-organic products such as wild fish predators such as seals and sea lions, parasites such as sea lice. This lack of control over inputs is evidenced by the quantity of pesticides, antimicrobials,

and antifoulants presently used and the extensive predator controls employed by many carnivorous fish producers using the open net cage system.

Second, carnivorous finfish naturally depend on fish protein as an important food source. Salmon producers, for instance, currently rely on wild fishmeal and fish oil as a key component of salmon feed. Yet, Section 6509(c) Practices states that:

"For a farm to be certified under this chapter as an organic farm with respect to the livestock produced by such farm, producers on such farm (1) shall feed such livestock organically produced feed that meets the requirements of this chapter"

In other words, organic livestock (including fish) must be fed 100 percent organic feed. As no wild fish are currently certified as organic, carnivorous fish farmer would not be able to meet the requirement of 100 percent organic feed if they rely on wild fish meal and fish oil.

Therefore, to meet the organic aquaculture standard, carnivorous finfish farmers would be required to switch to alternative feed sources that could meet the fish's dietary requirements but that are also 100 percent organic. While the Pure Salmon Campaign advocates for less intensive use of wild fish meal and fish oil in aquaculture production as a means of reducing pressure on wild fish populations, we believe that switching to an unnatural source of protein such as livestock by-products contradicts the standards proposed in the Aquaculture Working Group's Interim Final Report (Winter 2006). Section 205.252 Aquaculture feed states:

"To the greatest practical extent, cultured aquatic animals should be provided their natural foods as closely as possible"

At the same time, it is likely that less fishmeal and fish oil in a carnivorous fish's diet would likely translate to lower omega 3s benefits for the consumer of the fish. Thus, reducing the overall healthful benefits of eating carnivorous finfish like salmon.

Third, Section 1.2.4 of the NOSB Principles for Organic Production and Handling (adopted October 17, 2001) states that an organic production or handling system must:

"Maintain or enhance the genetic and biological diversity of the production system and its surroundings."

Far from maintaining or enhancing biodiversity, biological cycles, or soil biological activity, a large body of evidence suggests open net cage farming of carnivorous finfish is a threat to biodiversity.

Virtually all farmed Atlantic salmon are descended from 40 original stocks of Norwegian Atlantic salmon - hardly a robust gene pool.

And, the escape of these farmed salmon from net cage systems is not uncommon. Globally, an estimated three million salmon escape from farms annually (Naylor et al 2005). This situation is particularly concerning where non-native, farmed Atlantic salmon escape in regions such as British Columbia and Washington State, into the habitat of wild Pacific salmon populations - some of which are threatened. The potential for interbreeding and competition with wild salmon for food, habitat and mates is a hazard to biodiversity of regions where salmon is produced in net cages.

The Aquaculture Working Group's Interim Final Report does state that:

“Adequate measures shall be taken to prevent escapes of cultivated animals and plants from the aquaculture facility and to document any that do occur”

It could be argued, however, that most salmon producers already take “adequate measures” to prevent escapes of their product. But, turbulent weather, predators and overall weathering of cage materials, seem to inevitably lead to escapes of farmed fish from open net cages into the marine environment. For instance, in 1995, escaped Atlantic salmon had moved into 18 British Columbia rivers; six years later, they were living in 77 rivers and streams throughout the province (Lough and Law 1995). A 10-year Irish study showed conclusively that repeated escapes from salmon farms could lead to extinctions in wild Atlantic salmon populations (McGinnity et al 2003).

Given the permeable nature of open net cages, the transmission of diseases and parasites between wild fish and farmed fish (in both directions) also proves difficult to control. Most recently, research published in the National Academy of Sciences on October 2, 2006 indicated that up to 95 percent of wild juvenile salmon are killed by parasites from salmon farms (Krkosek et al 2006). Again, it appears that farming carnivores in open net cages leads to an overall loss of biodiversity of the surrounding. This loss of biodiversity is yet another inconsistency with the organic standard.

Lastly, Section 1.3 of the NOSB Principles for Organic Production and Handling (adopted October 17, 2001) explains:

“The basis for organic livestock production is the development of a harmonious relationship between land, plants and livestock, and respect for the physiological and behavioral needs of livestock.”

Salmon, in particular, are mostly an anadromous fish. In nature, they spend all or part of their adult life in salt water and return to freshwater streams and rivers to spawn. Yet, farming seems to ignore this innate migratory instinct and confines these fish to stationary net cages in coastal waters. Given this obvious clash between a salmon's behavioral needs and the farming of salmon in stationary net cages, an organic label for salmon seems especially paradoxical.

Specific Comments Regarding September 8, 2006 Invitation for Public Comment

NOSB Request: Species or Production Method Specific Standards

The Livestock Committee invites input relative to identification of and justification for the production systems or categories of species that should be considered separately. Further, the committee invites input on the identification of the specific sections of the Aquaculture Working Group Interim Final Report that may require species or production method specific standards.

Pure Salmon Response:

We urge to Livestock Committee to consider both production systems and species separately, given the significant variation in the environmental impacts of production systems and the biological and behavioral needs of different fish species.

As discussed above, we strongly urge the Livestock Committee to consider only those species, which, by their nature, could comply with the current definition of “organic.” This would include herbivorous finfish and low food chain species such a shellfish, which do not depend on wild fish for feed and which are farmed in controlled environment. In order for carnivorous finfish to be label “organic,” it appears that several core criteria — including the use of wild, or unmonitored food sources — of the organic standard would need to be disregarded.

In addition, the environmental impact of production methods can vary significantly. For instance, open systems such as net cages do not provide an impermeable barrier between the farmed fish/shellfish and the surrounding marine environment. In turn, there is simply no way for farmers to monitor the inputs (or outputs) of this type of production system.

As discussed in the “General Comments on Organic Carnivorous Finfish Aquaculture in Open Net Cages” above,” this type of open system often leads to the transmission of diseases and parasites and may result in the need for antibiotics and other chemicals to control transmission to farmed fish or wild marine organisms surrounding the net cages. Open systems also allow for the interactions between wild and farmed organisms and the unfiltered discharge of feces and uneaten feed into the natural environment. The lack of monitoring and tracking of inputs inherent to open production systems appears highly incongruous with an “organic” standard, and therefore, these production systems should not be considered for an “organic” label.

NOSB Request: Impact on the Environment

A fundamental principle of organic agriculture as described in the NOSB Board Policy Manual is that the soil and environment should be maintained or improved by organic

practices. It is assumed that organic aquaculture must be held to this same standard; however, terrestrial ecosystems are fundamentally different from aquatic ecosystems.

The Livestock Committee invites input from the organic community, consumers, aquaculture professionals, environmentalists and other interested parties as to how organic aquaculture will meet the requirement of maintaining or improving the environment, including the use of integrated net pen systems as proposed in the Aquaculture Working Group Interim Final Report.

Pure Salmon Response:

The Pure Salmon Campaign believes that the farming of low food chain species in controlled environments could very well maintain the soil and environment surrounding the farm, though we are unclear how a baseline measurement of “soil and environment” will be established and how changes or improvements will be measured.

As stated in our introduction, however, we strongly believe there is a large body of scientific evidence that demonstrates the significant degradation of the marine environment that can result from farming carnivorous finfish in open net cages. Below, we simply list the primary environmental impacts of carnivorous finfish farming in open net cages and references to scientific papers for further support.

- Researchers around the world have recognized the harm from open net cage salmon farms and the long-term impacts on water quality, fisheries resources and sea-bed ecology. (Cripps and Kelly 1996)
- The impacts of nutrient discharges into the marine environment have been demonstrated in numerous scientific papers (including Cripps and Kelly 1996; Hargrave et al 1997; Hardy 2000; MacGarvin 2001; Pohle et al 2001; Sutherland et al 2001; Wildish et al 2004).

While “integrated” net pen systems (or polyculture) have been offered as a solution to untreated waste discharged from open net cage fish farms, it is uncertain that all farm discharge will be absorbed and the impacts fully mitigated by a polyculture system.

- The prevalence of farmed salmon escapes and the interaction and competition with wild fish is well documented (including Gausen and Moen 1991; Tully and Whelan 1993; Einum and Fleming 1997; Fleming et al 2000; Matthews et al 2000; Sotto et al 2001; Morton and Volpe 2002; Naylor et al 2005; Butler et al 2005)
- Outbreaks of disease and parasites are virtually impossible to quarantine; mass escapes from open net cage salmon farms and the normal flow of tides and currents spread diseases and parasites to other fish over wide areas. The impacts

of disease and parasite transfer have been documented in peer-reviewed journals (including Hastein and Lindstad 1991; Bjorn et al 2001; Volpe et al 2000; Volpe et al 2001; Bjorn and Finstad 2002; Morton et al 2004; Morton et al 2005; Krkosek et al 2005; Krkosek et al 2006)

- While the proposed interim standards require aquaculture facilities to require that: “the culture system must be managed to minimize the risk of losses of cultured stock and stress to cultured aquatic animals caused by predators,” it still allows organic aquaculture facilities to use legal predator deterrence methods (although lethal methods of killing marine mammal predators is, for the most part, illegal in the United States).

However, the open net cage system inevitably attracts predators such as sea lions and seals. A study of a single salmon farm in British Columbia Canada, found that over a four-year period 431 harbour seals, 38 sea otters, 29 sea lions, one harbour porpoise, 16 herons, and one osprey were killed by anti-predator devices (Wursig and Gailey 2002).

Even where intentional shooting or killing of marine mammals is prohibited, there is documentation of marine mammals becoming entangled in net cages and drowning. This year, we learned from the BC Chief Inspector of Fisheries, Aquaculture Division of the provincial Ministry of Agriculture and Lands that 30 sea lions were caught and drowned in the net cages of a salmon farming company operating in a UNESCO Biosphere Reserve in Clayoquot Sound, British Columbia.

- In addition, the very nature of carnivorous fish requires that they consume wild fish for feed. While some salmon producers have been able to reduce the feed conversion ratio, salmon farming is still a net consumer of fish. This heavy dependence on wild fish for feed and the impact this has on global fisheries is also well documented. (including Naylor et al 2000; Naylor et al 2005; Tacon 2005)

In addition to the site-related impacts, we would also urge you to consider the carrying capacity of region and the cumulative impact of open net cages in a region. In other words, while one farm site may be not cause noticeable changes in the surrounding soil or environment, multiple sites could have a cumulative effect on the environment.

NOSB Request: Differences between Organic and Conventional Aquaculture Standards

Comments from organic consumers and other stakeholders on their expectations and explanations of the differences between organic aquaculture and conventional aquaculture methods and products are invited.

Pure Salmon Response:

The Pure Salmon Campaign is currently polling U.S. organic consumers to determine their definition of the difference between “organic” and conventional aquaculture. We plan to share the results of this polling at the upcoming meeting on October 18, 2006.

The Pure Salmon Campaign believes, however, that consumers would most likely assume that an “USDA Organic” label is imbued with a certain set of criteria, which would remain consistent across products. In fact, the National Organic Production states on its website that:

“The National Organic Program (NOP) regulations were developed to ensure that organically labeled products meet **consistent** national standards.”

As organic consumers, ourselves, we assume that aquaculture would be held to the same, consistent standards as those for livestock, which we have come to be familiar with.

According to the USDA website, the livestock standards say that:

“Producers are required to feed livestock agricultural feed products that are 100 percent organic, but may also provide allowed vitamin and mineral supplements.”

In addition:

“All organically raised animals must have access to the outdoors, including access to pasture for ruminants. They may be temporarily confined only for reasons of health, safety, the animal's stage of production, or to protect soil or water quality.”

As we have discussed in detail above, salmon farming in open net cages does not meet these criteria — as it uses wild fish for feed and fully confines a migratory animal for the entirety of its life cycle. If consumers were confronted with a “USDA organic” label on farmed salmon, it is likely they would expect 100 organic feed (which does not include wild fish or animal byproducts) and would expect a more natural environment than currently exists in open net cage sites.

We simply do not believe that in choosing “organic” seafood, a consumer would expect the following:

- Farmed in an open net cage with little control over inputs;
- Little to no protection from transmission of diseases and parasites to and from wild fish, leading to possible large scale mortality of wild fish;
- Lack of full treatment of wastes (feces and uneaten feed);
- Potential competition with wild fish for feed and mates;

- Potential lethal impacts on marine mammals and other marine organisms;
- Use of wild fish for feed;
- Unhealthy levels of PCBs and other contaminants;
- Fed livestock by-products such as poultry bones or feathers;
- An exotic species farmed in a sensitive habitat; and
- An overall negative impact on the marine environment

NOSB Request: Use of Fish Meal and Fish Oil

Will the organic consumer find the temporary 12% fish oil and fish meal allowances acceptable and what will consumer reaction be if (in a worst case scenario) certain aquaculture products no longer qualify as organic after the seven year fish oil and fish meal allowance period expires?

Will it be possible for other feed ingredients or organic sources of fish oil and fishmeal to be developed within this time frame to replace fish oil and fishmeal from sustainable capture fisheries?

Pure Salmon Response:

Our primary concern regarding this suggestion of a temporary allowance for 12% fish oil and fishmeal is that we do not understand the rush towards certifying carnivorous finfish as organic. If carnivorous finfish do not currently meet “organic” standards, then they should not be certified as such. It is our understanding that no other organic product has been allowed this transition or grace period, and we are uncertain as to why the USDA would make these allowances for a product that contradicts several key USDA organic standards.

Not only does the use of non-organic feed contradict current organic standards, this modification of the aquaculture standards is likely to lead to a large amount of confusion among U.S. consumers. We imagine this would especially occur if a product was initially certified as organic, but seven years later, lost its certification even though the production and handling process remained entirely the same.

In addition, while we support reducing the overall pressure that carnivorous aquaculture places on wild fisheries, we are not in support of substituting natural food sources of carnivorous fish with unnatural sources such as livestock by-products simply to obtain an organic label. Not only would this be inconsistent with the “organic” standard, but also it would also likely greatly reduce the healthful, omega 3 benefits provided by carnivorous fish such as salmon.

The Pure Salmon Campaign is not a feed expert, and therefore cannot adequately comment on whether or not it is possible to develop other sources of “organic” fish oil and fishmeal or other feed ingredients in this time frame. We simply reiterate that we support the interim organic aquaculture standards, which state: “To the greatest practical

extent, cultured aquatic animals should be provided their natural foods as closely as possible.”

NOSB Request: Sources of Fish Meal and Fish Oil

The Livestock Committee invites suggestions for appropriate criteria for sources of fishmeal and fish oil and methods to verify that sources meet such criteria.

Pure Salmon Response:

The Pure Salmon Campaign’s primary concerns regarding the identification of “sustainable” sources of fishmeal and fish oil are:

- **Wild fish is not organic** - We do not agree that aquaculture that requires wild fish for feed could ever fall within a truly “organic” standard. Therefore, we do not believe that determining “sustainable” sources of fishmeal and fish oil is a solution to the problem of labeling carnivorous aquaculture as “organic.”
- **No sustainable feed certification** - There is currently no certification of sustainable feed fisheries, though we understand the Marine Stewardship Council is potentially developing these standards. Until certified sustainable feed fisheries exist, however, there is no consistent verification that fishmeal and fish oil used in carnivorous finfish farming are coming from fully sustainable sources.
- **Future Pressure on Feed Fisheries** - Increasing commercial interest in feed fish is placing pressure on unexplored fisheries, as well. Absent effective management, we are concerned that these newly targeted fisheries may become overexploited or threatened. In addition to the recent attention to krill as a food for industrial fish farming (especially salmon, which it gives a natural pink hue), for instance, krill plays an important role in the Antarctic ecosystem. Especially vulnerable to global warming, this species is at certain risk for overexploitation. We urge to NOSB to consider not only the sustainability of current fish feed sources, but also the future impacts of the growing demand for carnivorous fish feed on once un-targeted fisheries, such as krill. For more information, visit www.kirllcount.org.
- **Pressure of Increased Carnivorous Finfish Production** - Farmed salmon production has grown exponentially in the past decade, and with it the pressure on wild fish as a source of fish feed. While feed conversions for farmed salmon have become more efficient, the continued increase in farmed salmon production translates to more demand for wild fish as feed.
- **New Carnivorous Species in the Pipeline** - As salmon has become more of a commodity product and salmon farming less profitable, salmon producers have

begun to shift towards production of other carnivorous fish species such as cod, turbot, haddock and barramundi. With this trend and the United State's focus on development of offshore aquaculture, it appears that the pressure on wild fisheries as a fish food source will continue to increase. In turn, even if "sustainable" fish feed sources are identified, it is uncertain that these fisheries will continue to remain sustainable as pressure on globally fisheries increases.

NOSB Request: Slaughter By-products in Aquaculture Feed

Should by-products from processing of terrestrial organic livestock, now prohibited in feeds for organic terrestrial mammals and poultry, be allowed as ingredients in organic aquaculture feeds?

Pure Salmon Response:

As you are aware, current organic standards prohibit the feeding of mammalian or poultry slaughter by-products. The Pure Salmon Campaign urges that this standard be extended to fish, both to ensure safety of feed components and also to maintain consistent criteria across the USDA organic standard. We believe that this particular issue of feeding livestock by-products to animals intended for human consumption is a concern among many consumers. Organic consumers have likely come to expect that "organic" products have not been fed livestock by-products.

In addition, the use of unnatural sources of protein contradicts the Aquaculture Working Group's Interim Final Report (Winter 2006), which states: "To the greatest practical extent, cultured aquatic animals should be provided their natural foods as closely as possible"

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